

Three little known species of *Ochlandra* Thwaites (Poaceae) from Western Ghats, India

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Abstract

Bamboos are, among the taxonomically least known groups of plants. Being monocarpic and flowering gregariously, collection of infructescence has been a great problem for taxonomists and consequently many taxa are, even now, known only from vegetative materials. This paper deals with three such taxa of *Ochlandra*, a genus of 8 species, occurring in South India, Sri Lanka and Madagascar, viz. *O. setigera*, *O. beddomei* and *O. travancoroca* var. *hirsuta*, the flowers and fruits of which have been recently collected and studied by us, for the first time. Their complete and amended descriptions are provided here.

Of the 136 species comprising 21 genera of Bamboos so far recorded from India, 32 species of 8 genera are known to occur in Peninsular India, which include 8 species which are introduced and cultivated in this region (Kumar, 1990). Occurring in remote forests and being monocarpic and gregariously flowering, the wild taxa of bamboos have been taxonomist's nightmare. Consequently, many of them still remain imperfectly known, especially with respect to their infructescence.

The earliest descriptions of Indian bamboos are found in van Rheede's Hortus Malabaricus (1678-1693), in which he described three species; *Bambusa bambos* (Syn. *B. arundinacea*), *Ochlandra scriptoria* (Syn. *O. rheedi*), and *O. travancorica*, (see Nicolson et al., 1988). Almost two centuries later, Munro (1868) provided us a sound footing in bamboo taxonomy by publishing a monograph of bamboos, which included 170 species of 20 genera, of which 52 species were described only on the basis of vegetative materials. Subsequently, Beddome (1873), in his Flora Sylvatica, dealt with 18 South Indian Bamboos, while, Gamble (1896) described 115 species from British India, the infructescence of many of which were not seen by the authors. Since then, bamboo taxonomists have, by and large, not been successful in improving upon these authors (Bahadur, 1979; Tewari, 1992). As suggested by Bennet and Gaur (1990), there is a great need for deeper studies and updating bamboo taxonomy, using both vegetative and reproductive characters.

Little known species of *Ochlandra* Thwaites (Poaceae)

The genus *Ochlandra* is endemic to South India (8 species and 1 variety) Sri Lanka (only one species, *O. stridula*), and Madagascar. Earlier descriptions of many species of this genus, have been based only on vegetative features, because of paucity of flowering and fruiting material. However, during explorations of the Western Ghats in Kerala, recently, we have been able to collect all of them in flowers and fruits. In this paper, we are redescribing three such taxa, namely *O. setigera*, *O. beddomei* and *O. travancorica* var. *hirsuta* in the light of these findings.

Ochlandra beddomei Gamble, Ann. Roy. Bot. Gard. Calcutta 7: 124: 1896 & in Hook. f., Fl. Brit. Ind. 7: 419. 1897; Camus, Les Bambusees 182. 1913; Varmah & Bahadur, Indian For. Rec. (n.s.) Bot. 6(1): 3. 1980.

(Fig. 1)

Culms 10—12 m high, 3—4 cm in diameter, nodal ridges minutely pubescent; internodes 15—17 cm long; culm sheaths deciduous, 11×3.5 cm, becoming smaller towards the tips of culms, broadly oblong, abruptly acuminate at tip and hairy at the constriction, tips reflexed or horizontal later. Leaves petioled; petiole to 5 mm long; lamina $10-14 \times 1.5-2.5$ cm, lanceolate, long-acuminate with a twisted, setaceous tip, rounded or slightly cuneate below, glabrous except on veins and margins, secondary nerves c. 8 pairs with 6—7 pairs of intermediates; seedling leaves much larger, to 50 cm long; leaf sheath minutely pubescent and striate, mouth callose with a few, erect, stiff, pale bristles, base auricled; ligule very small. Inflorescence of axillary or terminal spikate panicles. Spikelets verticelled, 1-flowered, 2—3.5 cm long, covered with bulbous based, spreading, brown hairs. Outer glumes empty, ovate-mucronate, many-nerved, hirsute, to 2 cm long. Lemma 2.8 cm long, ovate-lanceolate, mucronate, glabrous, many-nerved. Palea shorter than lemma, blunt. Lodicules 5, $2-2.5 \times 0.2-0.4$ cm, linear, obtuse, acute or forked at tip (all these in the same flower), 2—5 nerved, glabrous. Stamens many, exserted; filaments free; anthers narrow, 1.2—1.6 cm long. Ovary glabrous; perigynium produced into a stylar sheath; stigmas 6, linear, plumose. Caryopsis rounded or obovoid, to 3×2 cm, glabrous, subtended by persistent glumes; beak to 2.5 cm; pericarp thick and fleshy.

Specimen examined: Perinthada-chuthenpara, Thariode, Muktesh Kumar 6466 (KFRI).

Ochlandra setigera Gamble, Ann. Roy. Bot. Gard. Calcutta 7: 128 1896 & in Hook. f., Fl. Brit. Ind. 7: 420 1897; Camus, Les Bambusees 184. 1913; Varmah & Bahadur, Indian For. Rec. (n.s.) Bot. 6(1): 3. 1980.

(Fig. 2)

Culms erect or scandent, to 6 m tall, to 1.8 cm in diam.; nodes hardly swollen; internodes 20—30 cm long; culm sheath persistent, 15—19 cm long,

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Fig.1

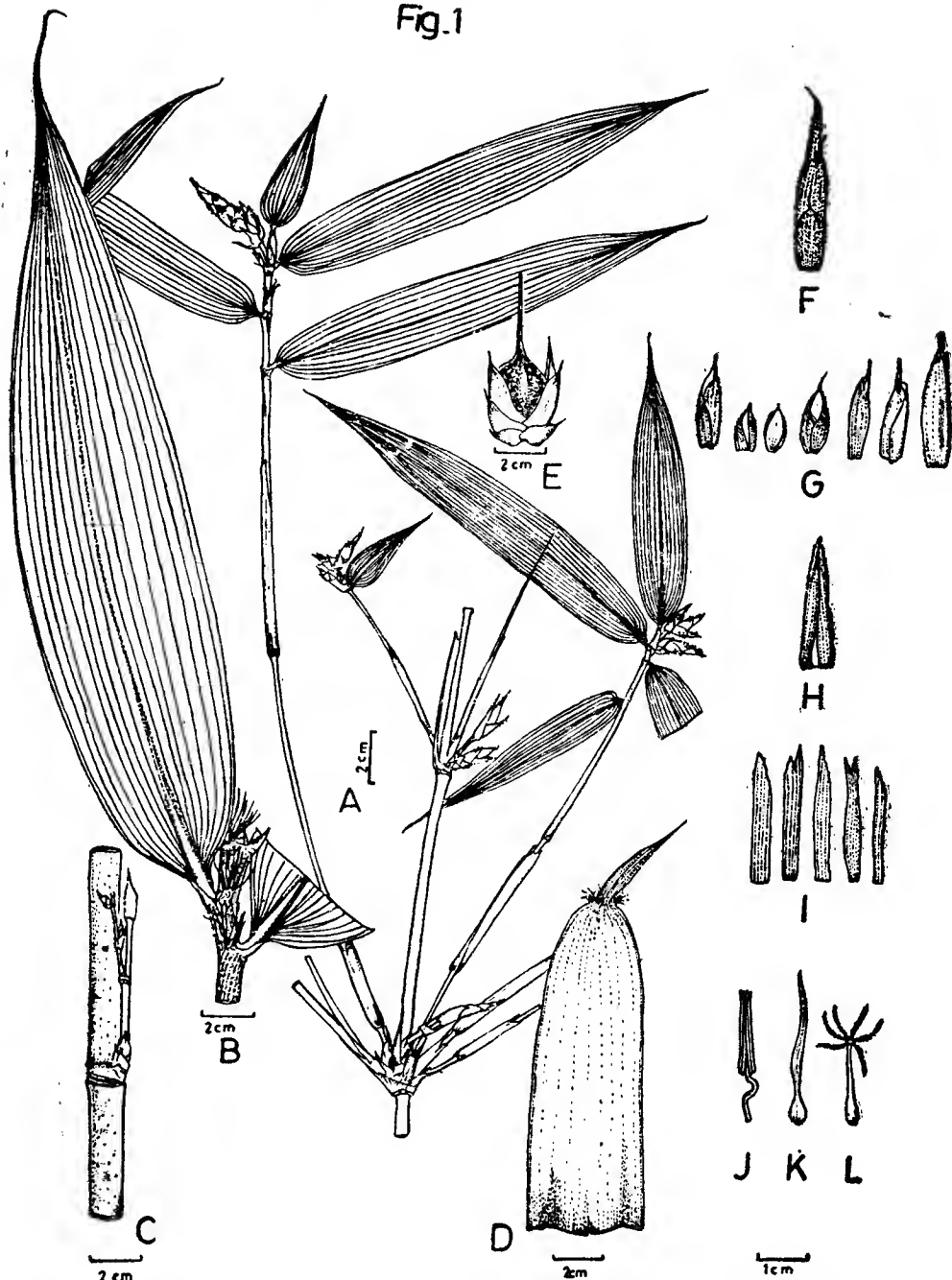


Fig. 1 *Ochlandra beddomei* A-Flowering twig, B-Portion of node showing leaf sheath, C-Nodal portion of culm showing young inflorescence, D - Culm sheath, E-Caryopsis, F-Spikelet, G-glumes, H-Palea, I-Lodicules. J-Stamen, K-Style-sheath, L-Pistil.

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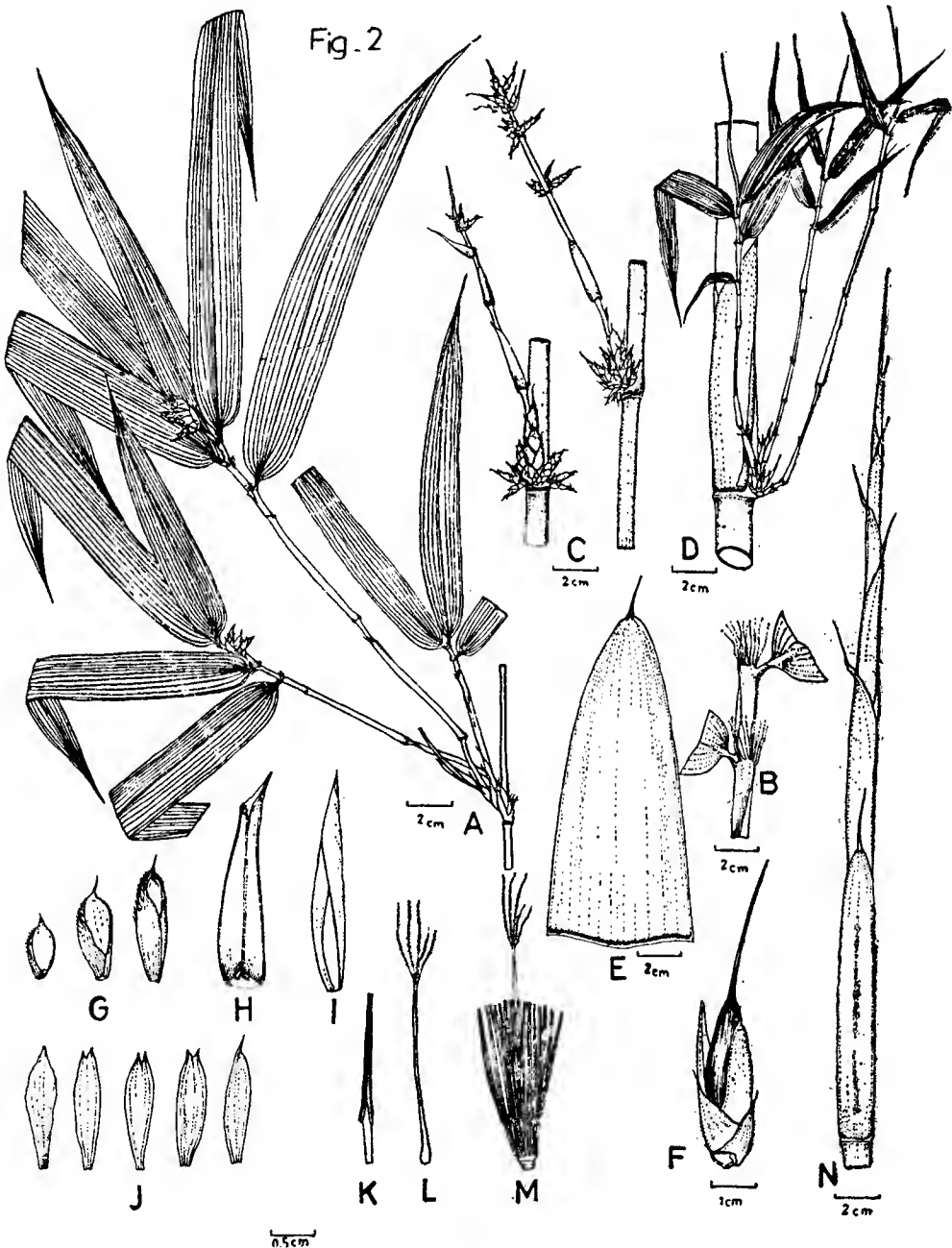


Fig. 2 *Ochlandra setigera* A-Flowering twig, B- Node showing leaf sheath, C-Axillary inflorescence, D-Nodal portion with leafy branches, E-Culm sheath, F-Caryopsis G-Empty glumes, H-Lemma, I-Palea, J-Lodicules, K-Stamen, L-Pistil, M-Androeium and Gynoecium, N-Tip portion of young culm.

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ovate-lanceolate, obtuse with an abrupt, subulate tip, thin, papery, striate and wrinkled above; ligule small. Leaves petioled; petiole 3–6 mm; lamina 12–26 × 2–3 cm, lanceolate-acuminate, tip subulate, twisted, base rounded; surface pellucid glandular above, minutely hairy beneath and scabrid on margins; secondary nerves 6–7 pairs with as many intermediates; leaf sheaths auricled at base, mouth bristly; bristles stiff, curved; ligules short. Inflorescence axillary or terminal spikate panicles. Spikelets in verticels of smaller sterile spikelets and larger fertile ones, clothed with dense white hairs, to 2.2 cm long. Basal empty glumes 7–13 mm long, ovate-mucronate, hairy, many-nerved. Lemma and palea larger, to 2.3 cm long. Lodicules 5 to 1.4 cm long, lanceolate or oblanceolate, acute, acuminate or forked at tip, 3–6 nerved. Stamens 26–32, exserted; filaments free; anthers 1.5 cm long. Ovary narrow, oblong, surmounted by a perigynium; stigma 5, plumose, unequal. Caryopsis oblong, narrowed towards the tip into a stylar beak, to 3.7 × 1.2 cm, subtended by persistent glumes; beak to 3 cm long; pericarp fleshy.

Specimen examined: Choondayil, Nilambur, Muktesh Kumar 6413 (KFRI).

Ochlandra travancorica Benth., var. *hirsuta* Gamble, Ann. Roy. Bot. Gard. Calcutta 7:126. 1896; Camus, Les Bambusees 183, 1913; Varmah & Bahadur Indian For. Rec. (n.s) Bot. 6(1): 4. 1980.

(Fig. 3)

Culms 2–6 m tall, 2–2.5 cm in diam., grey-green; nodes swollen; internodes very long; culm sheaths truncate with a long-subulate blade (4 cm long) at tip and fringed by erect, stiff bristles at the mouth, surface covered with appressed, black or golden, bulbous based hairs. Leaves petioled; petiole 4–8 mm long; lamina 9–32 × 5–6 cm, lanceolate with a setaceous, often twisted tip, rounded at base, pellucid glandular; secondary nerves 7–10 pairs with 6–8 pairs of intermediates; leaf sheath falcately auriculate at base and with a smooth, callose tip, appressed, bulbous-based hairy; ligule short, truncate. Inflorescence of axillary or terminal spikate panicles. Spikelets in verticels, some smaller and sterile, others larger and fertile, densely clothed with velvety hairs. Basal empty glumes 3, broadly ovate-aristate, margins inrolled. Lemma 4.5 cm long, oblong with a ciliate tip, margins inrolled; palea similar, faintly keeled on the back. Lodicules 3, dissimilar, membranous, 16–22 × 3–4 mm, linear or lanceolate, acute or forked at tip. Stamens numerous (upto 120); filaments connate below into a tube, free above; anthers linear-apiculate. Ovary ovoid; perigynium 3–4 angled; style linear; stigma 5, plumose. Caryopsis large, oval-oblong, abruptly beaked at apex, to 7.3 × 3.5 cm, subtended by persistent glumes; beak to 5 cm long; pericarp fleshy.

Specimens examined: Achancoil, Thenmala, Vijayakumaran & Jayalakshmi 7214, Pandimotta, Kulathupuzha Seethalakshmi & Jayalakshmi 7215; Pongamala Kulathupuzha, Muktesh Kumar 7216 (KFRI).

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Fig-3

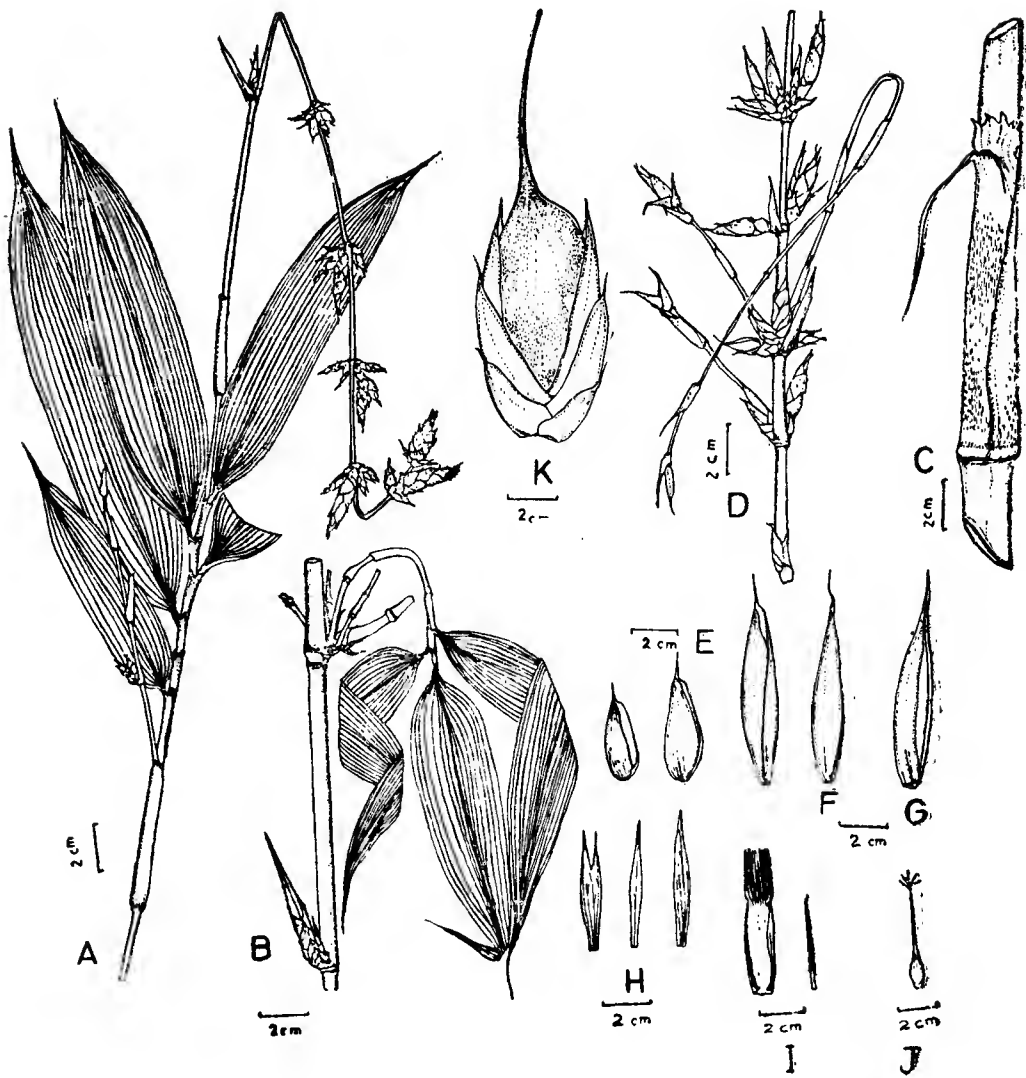


Fig. 3 *Ochlandra travancorica* var. *hirsuta* A-Flowering twig, B-a portion showing nodes and internodes, C-Culm with culm sheath, D-Inflorescence, E-Empty gluma, F, Lamma, G-Palea, H-Lodicules, I-Androecium, J-Pistil, K-Caryopsis.

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Literature Cited

- Bahadur, K. N. 1979. Taxonomy of Bamboos. *Ind. J. Forestry* 2(3): 222-224.
- Beddome, R. H. 1873. *The Flora Sylvatica for Southern India*. 3 Vols, (Reprints Edn. 1978, Dehra Dun).
- Bennet, S. S. R. and Gaur R. C. 1990. *Thirty-seven bamboos growing in India*, Forest Research Institute, Dehra Dun.
- Gamble, J. S. 1896. Bambusaeae of British India. *Ann. Roy. Bot. Gard. Calcutta*. 7: 1-133. t. 1-119
- Kumar, M. 1990. Reed bamboos (*Ochlandra*) in Kerala: Distribution and management. In: I. V. Ramanuja Rao, R. Gnanaharan and C. B. Sasthry (Eds.) *Bamboos: Current Research*, pp. 39-43. Singapore.
- Munro, W. 1868. Monograph of the Bambusaceae. *Trans. Linn. Soc. London Bot.* 26: 1-57.
- Nicolson, Dan H., Suresh C. R. and Manilal K. S. 1988. *An Interpretation of van Rhaede's Hortus Malabaricus*, Konigstein.
- Van Rheedee, H. A. 1678-1693. *Hortus Malabaricus*, Amsterdam. Vol. 1-12,
- Tewari, D. N. 1992. *A monograph of Bamboo*, Dehra Dun.